

SUMMARY OF WORKSHOP RECOMMENDATIONS

CONF-8405192--2

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The recommendations by the various groups regarding instrumentation are summarized in Table 1. There are a total of 39 instruments or experimental stations listed; 19 requiring a cold beam, 16 requiring a thermal beam, and 4 requiring a hot beam. Note that almost all the instruments have been recommended by more than one workshop group. This indicates that a multi-disciplinary group should be involved in detailed planning and design for these instruments.

To judge whether the preliminary plans for beam facilities are consistent with these workshop recommendations, we assume three instruments can be installed on a guide and one instrument on a horizontal or slant beam tube. From Table 1 of "Experimental Facilities" by R. M. Moon, we conclude that the present, tentative plans could accommodate the number of instruments given in Table 2.

The distribution of beams in the proposed HFIR modification seems to be about right, but it is disturbing that all the available experimental stations would be used by the instruments recommended by the workshop. It would certainly be desirable to have a number of unused stations to allow for future expansion and development of new instruments. Excess cold neutron capacity is present in the new facility plans (all eight guides are cold), but there is a shortage of thermal positions. This could be corrected by adding two thermal guides to the plan or by changing two of the guides from cold to thermal. Both of these options will be considered.

The workshop groups also made a number of more general recommendations, the most popular of which (mentioned by at least two groups) are listed below.

1. An entirely new reactor facility, rather than a modified HFIR, should be constructed. This is based on the presumption that better, more extensive experimental capabilities can be provided at a new facility, and on the desire to avoid a long period when there is no high-flux reactor operating at ORNL.
2. An instrument and ancillary development program should be established soon. This should include detector development and should not be tied to the approval of a new reactor.
3. A large selection of ancillary equipment should be provided for routine use by visitors in controlling their sample environment. This should include provisions for low and high temperatures, high pressures, and high magnetic and electric fields.

Table 1. Summary of instrument types recommended by workshop groups. Priority 1 is the strongest "must have" recommendation. Priority 2 is a somewhat weaker recommendation, but instruments given this priority are still highly desirable.

INSTRUMENT TYPE	NUMBER AND BEAM TYPE			PRIORITY						
	Cold	Thermal	Hot	Solid State	Chem.	Mat. Sci.	Polymer	Biology	Neut. Opt.	Nuc. Phys.
<u>Inelastic Group</u>										
triple-axis, polarized option		4		1		2				
triple-axis, polarized option	3			1	2					
triple-axis, polarized option			2	1	2					
time-of-flight, general purpose		1		1	1					
time-of-flight, high resolution	1			1	1					
time-of-flight, high intensity	1			1	1					
time-of-flight, low resolution		1				1				
backscattering	2			1	1				2	
neutron spin echo	1			1	1				2	
<u>Diffraction Group</u>										
single-crystal, 4-circle, optional area detector		1		1	1	2	2			
single-crystal, 4-circle			1		1					
single-crystal, large area detector, high resolution		1							1	
general purpose, rotating area detector	1								2	
high-resolution powder		1			1	1				
high-intensity powder, real time		1			2	1	2			
liquid and amorphous			1			1				
polarized-beam, single-crystal		1			1					
diffuse, fly's eye		1		1						
diffuse, energy analysis		1		1	2					
diffuse, polarization analysis	1			1						
<u>Small-Angle Group</u>										
high resolution	1				1	2	1	1		
high intensity, polarized option	1				1	1				
energy and polarization analysis	1			1	2					
double perfect crystal, very low q							2			

Table 1 (contd.)

INSTRUMENT TYPE	NUMBER AND BEAM TYPE			PRIORITY						
	Cold	Thermal	Hot	Solid State	Chem.	Mat. Sci.	Polymer	Biology	Neut. Opt.	Nuc. Phys.
<u>Optical and Nuclear Group</u>										
general optical station	3				1				1	
ultra-cold source	1								1	1
interferometer		1							1	
thermal stations		2*								1
cold, polarized stations	2									1
Total Number	19	16	4							

*One of these may be a radial tube with the entrance located close to the core to maximize the epithermal flux.

Table 2. Number of Instruments

Beam Type	Workshop Recommendation	Modified HFIR	New Facility
Cold	19	19	26
Thermal	16	13	11
Hot	4	3	3

4. Special laboratories close to the beam facilities should be provided for sample preparation (biology, chemistry) and characterization.
5. On-site housing for users should be provided.

The workshop recommendations will serve as valuable guidance for the future development of this project. Additional workshops will be held at appropriate times to consider the experimental facilities in greater detail.

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